

REMARKS

Claims 1-3 are presently pending in the application.

Claims 1 and 2 have been amended to recite that the compositions “comprise” rather than “consist essentially of” the recited components. Support for this amendment may be found in the specification at least at page 4, lines 4-17. Claim 2 has been rewritten as an independent claim. Finally, claims 1 and 2 have been amended to recite that the compositions contain an alkaline earth metal sulfonate, which is supported in the specification at least at page 22, lines 7-8 and in Examples 1-6. No new matter has been added by these amendments, and entry is respectfully requested.

In the Office Action, the Examiner has rejected claims 1 and 3 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,583,092 of Carrick (“Carrick”) in view of U.S. Patent Application Publication No. 2001/0044389 of Komiya (“Komiya”). Applicants respectfully traverse this rejection for the reasons set forth previously on the record, which Applicants rely upon in full, and for the additional reasons which follow, and respectfully request reconsideration and withdrawal of the rejection.

Rejection Under § 103(a) Based on Carrick in view of Komiya

Regarding claims 1-3, the Examiner maintains that Carrick discloses a lubricating oil composition comprising base oil, specifically mineral oil of the paraffinic and naphthenic type, and specific amounts of phosphorus and sulfur which allegedly overlap the claimed amounts. Carrick allegedly also discloses viscosity index improvers, including polymethacrylates, and a kinematic viscosity of the composition of 5 to 16.3 mm²/s at 100° C. The Examiner acknowledges that Carrick does not teach the kinematic viscosity and %Cp of the mineral oil. However, the Examiner argues that in view of the teaching of Carrick of the kinematic viscosity of the final composition and the fact that the composition comprises mineral oil and a viscosity index improver up to 10 wt%, a sufficient amount of viscosity index improver was added to the mineral oil to raise it to 5 mm²/s at 100° C from the initial viscosity. Therefore, the Examiner concludes that it would have been obvious to one having ordinary skill in the art at the time of

the invention for the initial kinematic viscosity of the mineral oil to also overlap that of the present claims.

The Examiner further argues that Komiya discloses a lubricating composition containing mineral oils, such as paraffinic and naphthenic mineral oils which have a kinematic viscosity of 1 to 4 mm²/s, which allegedly overlaps the claimed viscosity. Komiya allegedly also discloses the %Cp of the oil at 70 or higher. Therefore, the Examiner takes the position that the transmission oils disclosed by Carrick and Komiya contain similar mineral oils and would thus display the same characteristics. The Examiner concludes that it would have been obvious for the transmission oil composition disclosed by Carrick to comprise a base mineral oil having a %Cp from 75-81, as taught by Komiya, for enhancing low temperature fluidity.

As previously explained on the record, the purpose of the presently claimed invention is to provide low viscosity transmission lubricating oil compositions which can enhance fuel efficiency and improve the durability of gears and the shifting properties of wet clutches, including long-lasting shifting properties. Applicants have developed the presently claimed compositions with a low viscosity of 5.0 to 6.0 mm²/s at 100° C and a sulfur content of not more than 0.15 % by mass of the composition or of 0.05 to 0.14 %. These compositions are obtained by adding appropriate amounts of (B) a phosphorus compound in an amount of 0.025 to 0.05 mass % or 0.03 to 0.035 % as P, (C) a viscosity index improver ("VII") comprising a dispersion type or non-dispersion type polymethacrylate (PMA) having a number average molecular weight of from 5,000 to 35,000, (D) a sulfur-containing compound which is at least one compound selected from the group consisting of thiazole compounds, thiadiazole compounds, dithiocarbamate compounds, molybdenum dithiocarbamate compounds, dihydrocarbylpolysulfide compounds and sulfurized ester compounds, as well as an alkaline earth metal sulfonate, to (A) a specific mineral lubricating base oil having a kinematic viscosity of 2.3 to 3.4 mm²/s or of 2.5 to 3.3 mm²/s at 100°C and a %Cp of not less than 70 or of 73 to 82. The resulting compositions are highly fuel efficient and capable of improving the durability of gears and the shifting properties of wet clutches.

Carrick teaches a lubricating oil composition which contains: (A) a base oil, (B) an alkali or alkaline earth metal salt of a saligenin derivative, (C) an alkali or alkaline earth metal salt of a

hydrocarbon-substituted salicylic acid, and (D) a metal salt of a phosphorus-containing compound. The composition of Carrick preferably also includes (E) an acylated nitrogen-containing compound, (F) a boron-containing compound, and (G) a dispersant viscosity index modifier. Optional additives may be included, such as corrosion-inhibiting agents, antioxidants, viscosity modifiers, pour point depressants, etc. (col. 24, lines 63-67). The objective of the Carrick compositions is to provide a partial or complete replacement for sulfonate and phenate detergents without reducing performance attributes of the lubricant. That is, Carrick is directed to reducing levels of sulfur in lubricating oil compositions by minimizing or eliminating sulfonate and phenate detergents which are typically contained in such compositions as a source of sulfur. Carrick teaches that the use of saligenin derivative salts and salicylates can provide the advantages of a sulfur-free detergent without reducing the performance attributes of the lubricant. The Carrick compositions are thus taught to provide "improved high temperature deposit performance, oxidative stability, lead and copper corrosion inhibition, and improved seal compatibility" (col. 1, lines 23-33). Carrick thus teaches away from including sulfur-containing components in the composition since the goal is to minimize or eliminate sulfur.

Accordingly, Carrick does not teach or suggest a composition containing an alkaline earth metal sulfonate as claimed. Further, there would have been no motivation to modify the Carrick composition by adding such a sulfur-containing component, such as that taught by Komiya, since Carrick is directed to reducing or eliminating such components and teaches away from incorporating such a component into the Carrick composition. Accordingly, no *prima facie* case of obviousness has been established based on the proposed combination of Carrick and Komiya, and reconsideration and withdrawal of the § 103(a) rejection are respectfully requested.

In view of the preceding Amendment and Remarks, it is respectfully submitted that the pending claims are patentably distinct from the prior art of record and in condition for allowance. A Notice of Allowance is respectfully requested.

Respectfully submitted,

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Enclosures: Request for Continued Examination (RCE)
Petition for Extension of Time (one-month)